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| APPLICATION NO.  | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|--|-------------|----------------------|---------------------|------------------|
| 10/790,298   | 03/01/2004  | Khoi A. Phan         | H0266 / AMDP812US   | 9262             |
| 23623  | 7590        | 09/15/2006           | EXAMINER            |                  |
| AMIN, TUROCY & CALVIN, LLP<br>1900 EAST 9TH STREET, NATIONAL CITY CENTER<br>24TH FLOOR,<br>CLEVELAND, OH 44114 |             |                      |                     | LE, THAO X       |
| ART UNIT   |             | PAPER NUMBER         |                     |                  |
|  |             | 2814                 |                     |                  |

DATE MAILED: 09/15/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

|                              |                 |              |
|------------------------------|-----------------|--------------|
| <b>Office Action Summary</b> | Application No. | Applicant(s) |
|                              | 10/790,298      | PHAN ET AL.  |
|                              | Examiner        | Art Unit     |
|                              | Thao X. Le      | 2814         |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1) Responsive to communication(s) filed on 09 August 2006.  
 2a) This action is FINAL.                    2b) This action is non-final.  
 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4) Claim(s) 1-7 and 23-34 is/are pending in the application.  
 4a) Of the above claim(s) 28-31 is/are withdrawn from consideration.  
 5) Claim(s) \_\_\_\_\_ is/are allowed.  
 6) Claim(s) 1-7,23-27 and 32-34 is/are rejected.  
 7) Claim(s) \_\_\_\_\_ is/are objected to.  
 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

9) The specification is objected to by the Examiner.  
 10) The drawing(s) filed on \_\_\_\_\_ is/are: a) accepted or b) objected to by the Examiner.  
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
 a) All    b) Some \* c) None of:  
 1. Certified copies of the priority documents have been received.  
 2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) Notice of References Cited (PTO-892)  
 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)  
 3) Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
 Paper No(s)/Mail Date \_\_\_\_\_.  
 4) Interview Summary (PTO-413)  
 Paper No(s)/Mail Date. \_\_\_\_\_.  
 5) Notice of Informal Patent Application (PTO-152)  
 6) Other: \_\_\_\_\_.

**DETAILED ACTION**

***Continued Examination Under 37 CFR 1.114***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 8/9/06 has been entered.

***Claim Rejections - 35 USC § 102***

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1, 7 and 34 are rejected under 35 U.S.C. 102(b) as being anticipated by US 6230497 to Morris et al.

Regarding claim 1, Morris discloses in fig. 1-5J a heat regulating device for regulating a heat flow into and out of an integrated circuit semiconductor body comprising: a plurality of thermo-electrical structures 24 or 34 that creates a uniform temperature gradient, col. 1 line 60 and col. 5 line 37, across an integrated circuit semiconductor body 22 via heat inducement to and/or dissipation of generated heat

away, col. 3 line 25, from a portion of the integrated circuit semiconductor body 22, and at least one layer of a conductive material 62, col. 4 line 35, in contact with the thermo-electrical structure 24 for conducting heat flow.

Regarding claim 7, Morris discloses a heat regulating device for regulating a heat flow of an integrated circuit comprising: means 24, fig. 1, for inducing heat into a portion of a semiconductor body of the integrated circuit 22 utilizing a plurality thermo-electric structures 34, fig. 2, or a means 24 for dissipating heat away, col. 3 line 25, from the portion of the semiconductor region of a semiconductor body of the integrated circuit 22 utilizing a plurality of thermo-electric structure 34; the heat inducing means and/or heat dissipating means create a uniform temperature gradient, col. 1 line 60 and col. 5 line 37, across the semiconductor body 22; and heat conducting means 26 in contact with the means 24 for inducing heat into or dissipating heat away from the portion of the semiconductor body of the integrated circuit 22.

Regarding claim 34, Morris discloses a system in fig. 1 that facilitating reducing the accumulation and concentration of stress in an integrated circuit comprising means 20 for creating a uniform temperature gradient thought the integrated circuit bases 22 at least in part upon one of a heat the dissipation and heat induction, col. 3 line 245 and col. 5 line 37.

4. Claims 1, 7 and 34 are rejected under 35 U.S.C. 102(b) as being anticipated by US 6424533 to Chu et al.

Regarding claim 1, Chu discloses a heat regulating device in fig. 2A-3A for regulating a heat flow into and out of an integrated circuit semiconductor body

comprising: a plurality of thermo-electrical structures 30 that creates a uniform temperature gradient, col. 3 lines 30-33, across an integrated circuit semiconductor body 14 via heat inducement to and/or dissipation of generated heat away from a portion of the integrated circuit semiconductor body 14, and at least one layer of a conductive material 28, col. 5 line 25, in contact with the thermo-electrical structure 30 for conducting heat flow.

Regarding claim 7, Chu discloses a heat-regulating device in fig. 2A-3A for regulating a heat flow of an integrated circuit comprising: means 25, fig. 2B, for inducing heat into a portion of a semiconductor body of the integrated circuit 14 utilizing a plurality thermo-electric structures 30, fig. 2A, or a means 25 for dissipating heat away from the portion of the semiconductor region of a semiconductor body of the integrated circuit 14 utilizing a plurality of thermo-electric structure 30; the heat inducing means and or/heat dissipating means create a uniform temperature gradient, col. 3 lines 30-33, across the semiconductor body 14; and heat conducting means 28 in contact with the means 30 for inducing heat into or dissipating heat away from the portion of the semiconductor body of the integrated circuit 14.

Regarding claim 34, Chu discloses a system that facilitating reducing the accumulation and concentration of stress in an integrated circuit comprising means 25 for creating a uniform temperature gradient thought the integrated circuit bases 14 at least in part upon one of a heat the dissipation and heat induction, col. 3 lines 30-33.

5. Claims 34 is rejected under 35 U.S.C. 102(b) as being anticipated by WO 92/06561 to Brasington.

Regarding claim 34, Brasington discloses a system that facilitating reducing the accumulation and concentration of stress in an integrated circuit comprising means 4 for creating a uniform temperature gradient thought the integrated circuit bases, see field of invention, at least in part upon one of a heat the dissipation and heat induction.

6. Claims 1-7, 23, 25-26, and 32-34 are rejected under 35 U.S.C. 102(b) as being anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over US 6098408 to Levinson et al.

Regarding claims 1and 34, Levinson discloses in fig. 2 a heat regulating device for regulating a heat flow into and out of an integrated circuit semiconductor body comprising: a plurality of thermo-electrical structures 30, column 4 line 47, that creates a uniform temperature gradient across an integrated circuit semiconductor body via heat inducement to and/or dissipation of generated heat away from a portion of the integrated circuit semiconductor body (a semiconductor wafer would inherently include a IC such as transistor, capacitor, interconnections, etc..), col. 8 line 56, and at least one layer of a conductive material 20, col. 4 line 35, in contact with the thermo-electrical structure 30 for conducting heat flow.

The recitation of 'that creates a uniform temperature gradient across an integrated circuit semiconductor body via heat inducement to and/or dissipation of generated heat away from a portion of the integrated circuit semiconductor body' is only a statement of the inherent properties of the product. The structure recited in Levinson is substantially identical to that of the claims, claimed properties or functions are presumed to be inherent. Or where the claimed and

prior art products are identical or substantially identical in structure or composition, or are produced by identical or substantially identical processes, a *prima facie* case of either anticipation or obviousness has been established. *In re Best*, 195 USPQ 430, 433 (CCPA 1977) and MPEP 2112.01.

Regarding claim 2, Levinson discloses the heat regulating device wherein the thermo-electrical structure 30 is trough within the body of the layer of the conductive material 20, fig. 2.

Regarding claims 3-6, Levinson discloses the heat regulating device further comprising a plurality of the thermo-electrical structures 30 connected form a spreading assembly, fig. 2, wherein the spreading assembly is operatively connected to a heat sink, fig. 10, wherein the thermo-electrical structure 30 is a conductive pathway for heat transfer, wherein the thermo-electrical structure 30 has a structure selected from a group comprising of maze-shaped structure, fig. 2.

Regarding claim 7, Levinson discloses a heat regulating device for regulating a heat flow of an integrated circuit comprising: means TC', fig. 10, for inducing heat into a portion of a semiconductor body of the integrated circuit 180 utilizing a plurality thermo-electric structures 30, fig. 20, or a means TC' for dissipating heat away from the portion of the semiconductor region of a semiconductor body of the integrated circuit (a semiconductor wafer would inherently include IC structure such as transistor, capacitor, interconnection, etc..) utilizing a plurality of thermo-electric structure 30; the heat inducing means and or/heat dissipating means create a uniform temperature gradient across the semiconductor body ; and heat conducting means 20 in contact with the

means 30 for inducing heat into or dissipating heat away from the portion of the semiconductor body of the integrated circuit.

The recitation of 'that creates a uniform temperature gradient across an integrated circuit semiconductor body via heat inducement to and/or dissipation of generated heat away from a portion of the integrated circuit semiconductor body' is only a statement of the inherent properties of the product. The structure recited in Levinson is substantially identical to that of the claims, claimed properties or functions are presumed to be inherent. Or where the claimed and prior art products are identical or substantially identical in structure or composition, or are produced by identical or substantially identical processes, a *prima facie* case of either anticipation or obviousness has been established. *In re Best*, 195 USPQ 430, 433 (CCPA 1977) and MPEP 2112.01.

Regarding claims 23, 25-26, Levinson discloses the heat regulating device with components 42, col. 4 line 54, embedded into the spreading assembly to manage the heat flow away from and/or into the portion of the semiconductor body of the integrated circuit, fig. 10, wherein the thermo-electrical structure being embedded with measuring device to measure various physical properties of the portion of the semiconductor body of the integrated circuit, fig. 10, wherein the thermo-electrical structure 30 being external element attached to the surface of the heat regulating device, fig. 2.

Regarding claim 32, Levinson discloses a heat regulating device wherein the thermo-electrical structure 30 is a composite, col. 4 line 55, composed of a layer having

at least one part tailored to a heat-generating characteristic of a portion of the integrated circuit semiconductor body.

Regarding claim 33, Levinson discloses a heat regulating device at least one thermo-electric structure 30 is integrated with the semiconductor body such that the thermo-electrical structure is positioned in a region of the semiconductor body where a hot spot (IC would generate heat) is anticipated, fig. 10.

***Claim Rejections - 35 USC § 103***

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

9. Claims 24 is rejected under 35 U.S.C. 103(a) as being unpatentable over US 6098408 to Levinson et al. in view of US 6729383 to Cannell et al.

Regarding claim 24, Levinson does not disclose a heat regulating device wherein the thermo-electrical structure having a denser distribution of line patterns towards the center of the structure and a less dense distribution of lines towards the outer limits of the structure.

However, Cannell a heat dissipating structure can be formed in various arrangements, col. 2 lines 49-57. At the time the invention was made; it would have been obvious to one of ordinary skill in the art to use the teaching of Cannell with Levinson as claimed, because it would have either increased or decreased the heat transfer surface for intended used.

10. Claim 27 is rejected under 35 U.S.C. 103(a) as being unpatentable over US 6098408 to Levinson et al. in view of US 6105381 to Ghoshal.

Regarding claim 27, Levinson does disclose a heat regulating device fabricated from a combination of various layers of ceramic 48, col. 4 line 58.

But Levinson does not disclose a heat regulating device fabricated from a combination of various layers of silicon carbide and diamond.

However, Ghoshal discloses a thermo electro deice 454 connects to a diamond, col. 5 lines 38-40. At the time the invention was made; it would have been obvious to one of ordinary skill in the art to replace the ceramic material of Levinson with the diamond layer teaching of Ghoshal, because it would have created a high thermal conductivity material as taught by Ghoshal, col. 5 line 40.

***Response to Arguments***

11. Applicant's arguments with respect to claims 1,7 and 34 have been considered but are moot in view of the new ground(s) of rejection.
12. With respect to Levinson, as discussed in the above claims, the structure recited in Levinson is substantially identical to that of the claims, claimed properties or functions are presumed to be inherent. Or where the claimed and prior art products are identical or substantially identical in structure or composition, or are produced by identical or substantially identical processes, a *prima facie* case of either anticipation or obviousness has been established. *In re Best*, 195 USPQ 430, 433 (CCPA 1977) and MPEP 2112.01.

***Conclusion***

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thao X. Le whose telephone number is (571) 272-1708. The examiner can normally be reached on M-F from 8:00 AM - 4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael M. Fahmy can be reached on (571) 272 -1705. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only.

For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



THAO X. LE  
PRIMARY PATENT EXAMINER

08 Sept. 2006